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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/903,627	07/13/2001	Stephen C. Kenyon	13680.00005	2161

27160 7590 06/17/2005

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EXAMINER	
KNEPPER, DAVID D	

ART UNIT	PAPER NUMBER
2654	

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/903,627	KENYON ET AL.	
	Examiner	Art Unit	
	David D. Knepper	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 Aug 2004, 10 Jan 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *See Continuation Sheet* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,21-23,25-27,32-36,38-51,53-55,57-64,67-83,86-99 and 102-137* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10 Jan 2005*. 3 2 sheets
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims pending in the application are 1-19,21-23,25-27,32-36,38-51,53-55,57-64,67-83,86-99 and 102-137.

1. Applicant's response to the written restriction requirement (paper #9, mailed 29 Jan 2004) was communicated by telephone on 5 February 2004 making an oral election for Group I, with traverse. Claims 1-19, 21-23, 25-27, 32-36, 38-51, 53-55, 57-64, 67-83 and 86-99, 102-137 are pending. Clams 20, 24, 28-31, 37, 52, 56, 65, 66, 84, 85, 100, 101 and 138 have been canceled.

2. During a telephone conversation with Richard Bauer on 17 March 2004 the applicant indicated that an election with traverse. However, no grounds for traversal were presented and all non-elected claims have been canceled.

Abstract

3. The Abstract of the Disclosure is objected to because the first sentence repeats information given in the title. The first 2 sentences could be deleted. Correction is required. See M.P.E.P. § 608.01(b).

Drawings

4. The drawing changes received 17 Aug 2004 are approved.

Specification

5. The disclosure is objected to because of the following informalities:

The summary of the invention on pages 7-8 (paragraphs 12-14), contain recitations of the claims that are contrary to the spirit and intent of CFR § 1.73:

"Summary of the invention: A brief summary of the invention indicating its nature and substance, which may include a statement of the object of the invention, should precede the detailed description. Such

summary should, when set forth, be commensurate with the invention as claimed and any object recited should be that of the invention as claimed."

Permitting cosmetic makeover of claims to be considered part of the disclosure would amount to having the claims provide the only specification for themselves. Such invalid circular reasoning cannot be allowed.

For applications originating from foreign patents, the equivalence of a summary can be found in sections titled as "Problem Statement", "Proposed Solution", "Approach" & etc. rather than the claims.

Appropriate correction is required.

Claims

6. Claims 97-99, 116-120, 126 and 137 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 97-99, 116-120, 126 and 137: There is no antecedent in the specification for filtering that removes noise and for an error detection algorithm or device.

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 97-99, 116-120, 126 and 137 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter, which

was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Filtering to remove aliasing effects is taught in the specification but no methods for removing various types of undesirable noise are taught or illustrated.

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-10, 12-14, 17-27, 32-42, 44-46, 49-72, 75-83 and 86, 87, 89, 92-96, 102-105, 109-114, 121-125, 128-135 are rejected under 35 U.S.C. § 103 as being unpatentable over Thrift (6,188,985) in view of Hoffberg (6,519,564), Furui (Digital Speech Processing, Synthesis, and Recognition) and Wang (US 2002/0083060).

As per claim 1, "recognizing free-field audio signals" is taught or suggested by Thrift's voice-activated device, figure 1:

> "hand-held device having a microphone" (his voice-activated control unit 10 – which is a compact hand-held unit, col. 2, lines 1-3);
>
> "a local processor" (his processor 10e);

"extracts a time series of spectrally distinct audio signals features from the captured free-field audio signals" (his transmitter 10g in combination with processor 10e, figure 1 which performs all or part of the voice recognition process, col. 3 lines 1-5 where Thrift teaches that it is obvious to perform part of the analysis and then transmit the partially processed data such as linear predictive coding (LPC) analysis, col. 3, lines 18-21 to another computer system for recognition processing – Furui teaches details necessary for proper recognition of signals that are omitted from Thrift and Hoffberg on pages 231-237); and

"recognition processor and a recognition memory at the recognition site" (his host computer 11 – Furui teaches details necessary for proper recognition of signals that are omitted from Thrift and Hoffberg on pages 231-237).

It is noted that Thrift does not explicitly teach "free-field audio". However, he teaches that a microphone is used to capture speech or voice input. Hoffberg teaches that it is well known that speech recognition 216 techniques may be used to recognize music style pattern recognition 218, figure 2. The term "free-field audio" is defined in the art as audio that does not have any interference from echoes. Capturing audio inside a structure would normally have some degree of echo off the walls and would therefore not be "free-field". This term would therefore limit the apparatus for recognizing audio to an open space or in a room where walls are treated to prevent echoes. It would have been obvious for a person having ordinary skill in the pertinent art, at the time the invention was made, that the speech recognition system of Thrift which uses a microphone could be applied to receive any audio whether "free-field" or otherwise because Hoffberg teaches that speech recognition may be applied to other forms of audio such as

music and one of ordinary skill in the art would find it obvious that a variety of audio sources would include their occurrence in "free-field" environments.

It is noted that Thrift and Hoffberg do not teach details for "recognition" based on "a time series of spectrally distinct audio signals". However, they clearly indicate that known parameters for speech recognition may be used to recognize other audio signals. Furui teaches common spectral analysis techniques on pages 230-231 which may be used to form templates which are compared to real time analysis using the same technique. Known distance or correlation measurements are taught on pages 231-237, which yield the parameter that indicates which template, is the best match. It would have been obvious to use the parameters taught by Furui because Thrift (1997) and Hoffberg (1999) teach that it is necessary to use known speech recognition techniques to recognize audio signatures (speech or music, col. 1, lines 52-56) and Furui teaches various alternatives that were known in the art before 1989 to perform recognition.

It is noted that Thrift, Hoffberg and Furui do not explicitly teach "a portion of a recorded audio work that is less than an entire recorded audio work" or that "any portion...of a recorded audio work that is less than the entire recorded audio work" may be utilized for recognition as claimed. However, Thrift, Hoffberg and Furui do not specify how much of the signal input is required. Wang explicitly teaches that the captured part may be only a small portion of any type of audio, including sound, voice, music or combinations of types in paragraphs 37-38. Combinability is explicitly taught by Wang in paragraph 105, which states: Once the correct sound has been identified, the result is reported to a user or system by any suitable method. For example, the result can be reported by a computer printout, email, web search result page, SMS (short message service) text messaging to a mobile phone, computer-generated voice annotation

over a telephone, or posting of the result to a web site or Internet account... Furthermore, Wang explicitly teaches that such computer based combinations with wireless and other communication methods may be used to provide purchase information in paragraph 107.

Claims 2, 34, 62, 86, 104, 121, and 122: See claim 1 above. One of ordinary skill in the art would find it obvious to employ "analog-to-digital" conversion because the audio input of Thrift must be converted to a digital signal in order to be processed by a signal processor (col. 3, lines 5-21). It is inherently necessary to perform such a conversion based on the teachings of Thrift because if no digital conversion is done, then an analog signal processor would be required which is contrary to the frequency analysis of LPC, which is normally done with digital signal processors. Furui also assumes that spectral analysis of audio will be done using digital signal processing (pages 45-47).

Claim 3: This is anticipated by the suggested use of LPC extraction as part of a front-end process (col. 3, lines 18-22).

Claims 4, 21, 25, 36, 64, 79: Thrift shows the host computer connected to the **internet** but Hoffberg shows that the personal computer that audio is input into is a computer with a browser with a connection to the internet. Therefore, it would have been obvious that computers could be provided with Internet access at various levels because Hoffberg teaches that his browser may be connected through the Internet to access another computer (server) that performs recognition.

Claim 5: Thrift clearly teaches that the recognition processor must contain memory with audio templates regardless of its location 10f or 11b (figure 1).

Claim 6, 38, 78, 82: Thrift does **not** require storage of **an entire audio work** before transmitting and by indicating that the control unit may only be a front end processor, teaches that it must only start producing parameters capable of transmission. Hoffberg similarly teaches that music input does not need to include the whole work but may be limited to musical themes (sequence of notes, rhythmic signature, etc).

Claims 7, 39, 67, 92, 102, 103 and 105: See the musical themes of Hoffberg, which would inherently comprise a **song**.

Claim 8: As taught by Thrift (noted above in claim 1), it is obvious to perform all or part of the recognition on a local or host computer.

Claim 9: Thrift teaches that the recognition may be performed at the host computer where the computations necessary for recognition would take place.

Claim 10: See claim 1 above. The use of digital conversion is discussed in claim 2 above.

Claims 12, 44: Official Notice is given that "**flash memory**" is defined as non volatile storage that can be electrically erased in the circuit and reprogrammed. It would be obvious to use this type of memory to store any type of data because it has the desirable characteristics of being programmable to retain varying data and will not lose data when power is interrupted.

Claim 13, 45, 71: See the LPC suggested by Thrift (claim 1) represent "**different frequency bands**" and the well known alternatives taught by Furui (pages 230-231) not only shows generic frequency band analysis but also teaches the use of psycho acoustically significant spectral values known as Bark scale or Mel-scale, page 232.

Claim 14, 46, 72: The parameters for analysis by Furui and LPC by Thrift are all commonly used for **compression**. Using them for compression is obvious because Thrift teaches that LPC used for transmission and compression most commonly performed to reduce the bandwidth needed to transmit signals to other locations.

Claims 17, 49, 75, 110, 123: The use of a "**radio receiver**" is anticipated by Thrift's wireless device (abstract).

Claim 18: See claim 1 above. The use of "data capturing" is taught by Thrift's indication that the unit 10 may capture data that is sent to the host computer 11 (col. 3, lines 1-8).

Claims 19, 26, 27, 40, 51, 58, 59, 68, 77, 83, 87: The ability to provide "**a verification signal**" is taught by Thrift's feedback that comes after recognition of commands, col. 3, lines 57-67 which continues to explain feedback from the host system 11 may be graphical (including ... audio), col. 4, lines 2-3. See his data receiver 10h. Further audio feedback is taught in column 4, lines 33-67 regarding the ability to recognize questions and supply appropriate answers audibly.

Claims 22, 80: See claim 1 above. The ability to store "**an entire audio work**" is taught by Thrift in col. 1, lines 49-52 where he teaches: The idea behind the Web is to collect all kinds of data from all kinds of sources, avoiding the problems of incompatibilities by allowing a smart server and a smart client program to deal with the format of the data.

Claims 23, 35, 55, 63, 81: The signal processing details for analysis of a "**time series waveform**" are taught by Furui. Furui teaches the use of spectral distance measures for rank ordering the best match. Ordering statistics based on "distinctiveness" is well known for psycho acoustically important information as taught by Furui such as the proper spacing of frequencies (Bark scale or Mel-scale, page 232 which order the frequencies and bandwidth spacing based on

the human auditory system) and also on various applications of weighting, pgs. 237-243 which help to emphasize important features so they are transformed in a way that improves recognition).

Claims 32, 60: See claim 1 above. "**Randomly** selecting any one portion of the received data stream" is obvious in view of Hoffberg's teaching that A web site thus identified is preferably visited a number of times, (col. 3, lines 53-56) for clustering resources with a similar profile. Neither particular order for selection of web sites nor any order for visiting a particular web site is taught or suggested. Therefore, it would have been obvious to make such a selection using any known statistical method for collecting data, which would include a random selection.

Claims 33, 41, 69: See claim 1 above. Furui teaches correlation techniques. "**Correlation**" could be considered the same as computing a distance (pages 230-243). Alternatively, statistical types of correlation calculations include autocorrelation (pages, 231-232).

Claims 42, 50, 53, 54, 57, 61, 76: See claim 1 above. Performing recognition at a "**recognition site**" is taught by Hoffberg's server 202 connected through the Internet.

Claim 70 is rejected under similar arguments as applied to claims 1 and 2 above.

Claim 89, 93-96, 109, 111, 124, 125, 129-134: Providing a "**display**" is taught by Thrift's display 10a, figure 1 and Hoffberg's browser 228, fig. 2. Hoffberg teaches that the type of data to be displayed is in a relational database where the content is indexed by an indexer 220 in a **data base** 222 as relating to a certain natural language, one or more music styles, col. 4, lines 25-27 and includes bibliographic information items ... for display to the user, col. 5, lines 20-21. In addition to music other audio data may be streamed as taught by Hoffberg to include

live radio broadcasts, col. 4, line 39 and news services, col. 4, line 48. Thus, it would obvious to include "advertisements" and related information commonly associated with live radio and news broadcasts in addition to music related information.

Claims 112-114, 128, 135: See claim 1 above. A "unique code" is considered the same as the templates created for recognition of various sources in the database made up of spectrally distinct features. If they were not distinct or unique, then data elements from which the database was created could not be distinguished one from another for recognition. The analysis must create distinct output for different signals in order for different signals to be distinguished from each other. See, for example, the signature of various kinds of music . . . classical music has typically a different speech recognition signature than rock music, col. 1, lines 52-56. This what may be stored in the database 222, fig. 2 along with other related data.

11. Claims 11, 43, 118, 120, 126, 137 are rejected under 35 U.S.C. § 103 as being unpatentable over Thrift (6,188,985) in view of Hoffberg (6,519,564), Furui (Digital Speech Processing, Synthesis, and Recognition) and Wang, as applied to claims 10, 104 and 121 above and further in view of Smith (Digital Signal Processing).

Claim 11, 43: "Anti-aliasing" is defined as removing spurious frequencies from waveforms produced by converting digital signals back to analog. Any competent engineer would not only be aware of the definition but would know "filtering" techniques to achieve its implementation. See, for example, page 48 from Smith which is a treatise on digital signal processing showing that an anti alias filter is desirable for any data conversion between analog and digital formats.

Claims 116-120, 126, 137: Using "filtering" to remove noise is a common digital signal processing technique. See Smith, pages 368-372. He teaches that it is well known to use a time varying Wiener filter on page 369 to remove noise from audio. Therefore, it would have been obvious to use a Wiener filter in the digital signal processing required for recognition because Smith teaches this will reduce undesired wideband noise.

12. Claims 15, 16, 47, 48, 73, 74, 88, 90, 91, 106-108, 115, 127, 136 are rejected under 35 U.S.C. § 103 as being unpatentable over Thrift (6,188,985) in view of Hoffberg (6,519,564), Furui (Digital Speech Processing, Synthesis, and Recognition) and Wang as applied to claims 10, 42, 70, 86, 87, 104, 121 above and further in view of Murui (4,959,850) or Grimm (5,907,815).

Claims 15, 47, 73, 88, 90, 91, 106, 115, 127, 136: The elements of device 10 (Thrift) include common elements to a cellular telephone such as a wireless transmitter 10g, see abstract. Therefore, such a device would be within the scope of Thrift because it is well known to affect Internet connections using telephones including wireless telephones. Murui and Grimm show common **cellular** telephones, which may include recognition and synthesis (col. 1, line 20 and Fig. 4A, Murui) or various voice/data capture capabilities (col. 2, line 20 and Figs. 13-168, Grimm). It would have been obvious to modify either Murui or Grimm with the improvements of Thrift because Thrift teaches that a hand-held wireless device can be used to capture and pre-process audio that can be transmitted for further processing for recognition and to provide greater functionality by connecting to the Internet.

Claim 16, 48, 74: The use of a "portable device assistant" is a well known alternative taught by Grimm's personal digital assistant "PDA" (col. 2, lines 20-21).

Claim 107: Using a phone number to establish a connection is inherent in cellular phones.

Claim 108: See claim 1 above for use of a microphone to pick up sound.

13. Claims 97-101, 116, 117, 119 are rejected under 35 U.S.C. § 103 as being unpatentable over Thrift (6,188,985) in view of Hoffberg (6,519,564), Furui (Digital Speech Processing, Synthesis, and Recognition) and Wang, as applied to claim 10 above, further in view of Murui (4,959,850) or Grimm (5,907,815) as applied to claims 86, 104 above and further in view of TIA/EIA-627 (Telecommunications Industry Association standard of June 7 1996)

Claims 97-101, 116, 117, 119: For cellular telephones, standards are defined which require certain types of noise filtering and error checking. TIA/EIA-627 defines requirements for a perceptual noise weighting filter on pages 31-34. To detect errors, TIA/EIA-627 teaches the use of a Cyclic Redundancy Check (CRC) on pages 58-60 and 63. Pages 58 shows the CRC polynomial generator and page 68 shows how the CRC is actually used to implement masking of bad frames that are detected.

Prior Art

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Larouche (6,453,252) and Kanevsky (6,434,520) are cited to show that particular processing techniques are well-known for the analysis and recognition of audio based on part of an audio work.

Remarks

15. The applicant's remarks make reference to the Interview conducted 14 July 2004 but do not provide specific explanations to address each rejection.

Additional art is utilized to address further limitations discussed regarding the extraction of signals that only represent a portion of a complete audio work. As was discussed in the noted interview, the applicant pointed out that the invention was intended to protect the ability to analyze a relatively short portion of input audio and to use this portion to correctly identify a longer audio work (such as a song). A further search as well as additional art provided by the applicant reveals that this application is known and therefore the claims are rejected as noted above.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

17. Some correspondence may be submitted electronically. See the Office's Internet Web site http://www.uspto.gov for additional information.

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Effective 14 January 2005, except correspondence for Maintenance Fees, Deposit Accounts (see 37 CFR 1.25(c)(4)), and Licensing and Review)see 37 CFR 5.1(c) and 5.2(c)), please address correspondence delivered by other delivery services (i.e. – Federal Express (Fed Ex), UPS, DHL, Laser, Action, Purolater, etc.) as follows:

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18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David D. Knepper whose telephone number is (571) 272-7607. The examiner can normally be reached on Monday-Thursday from 07:30 a.m.-6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil, can be reached on (571) 272-7602.

For the Group 2600 receptionist or customer service call (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Inquiries regarding the status of submissions relating to an application or questions on the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 703-305-3028 between the hours of 6 a.m. and midnight Monday through Friday EST, or by email at ebc@uspto.gov. For general information about the PAIR system, see http://pair-direct.uspto.gov .

David D. Knepper
Primary Examiner
Art Unit 2654
June 2, 2005

approved

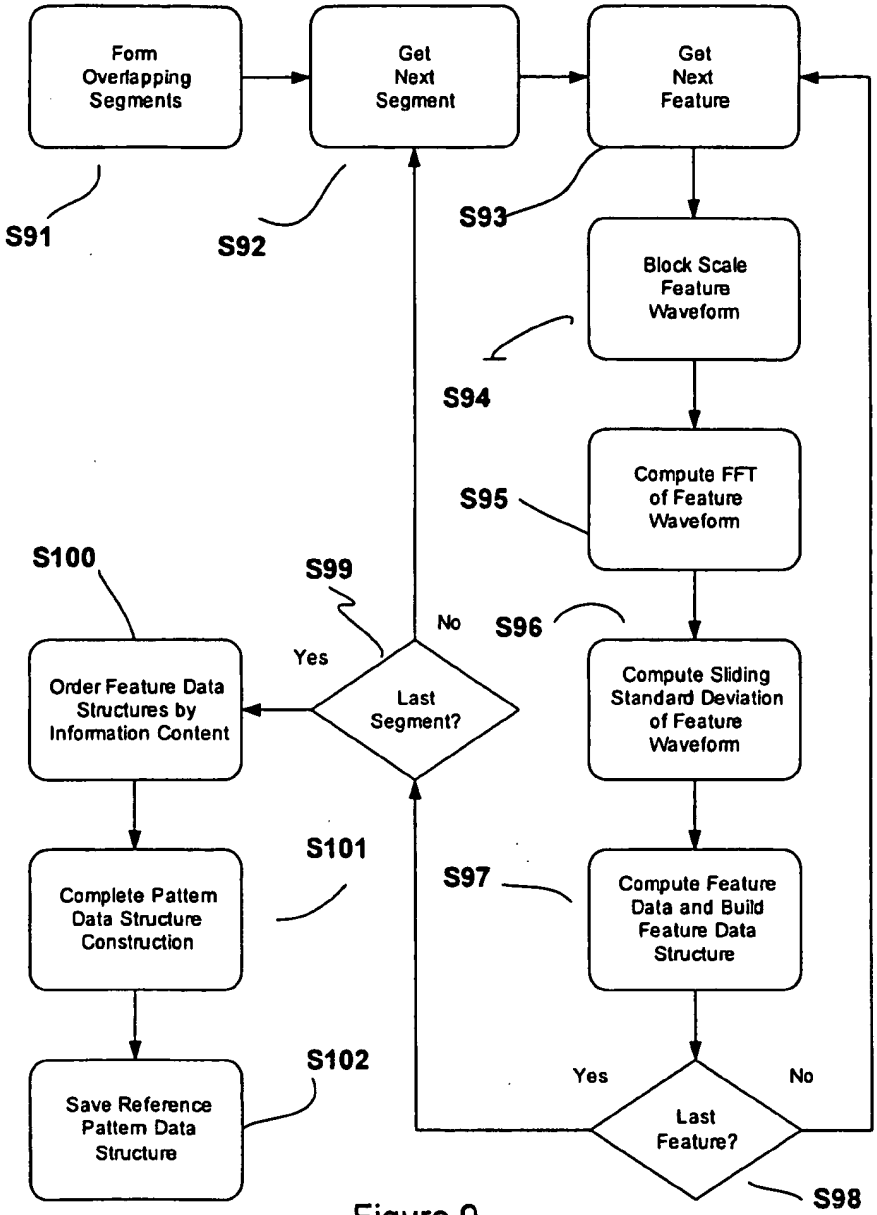

Figure 9

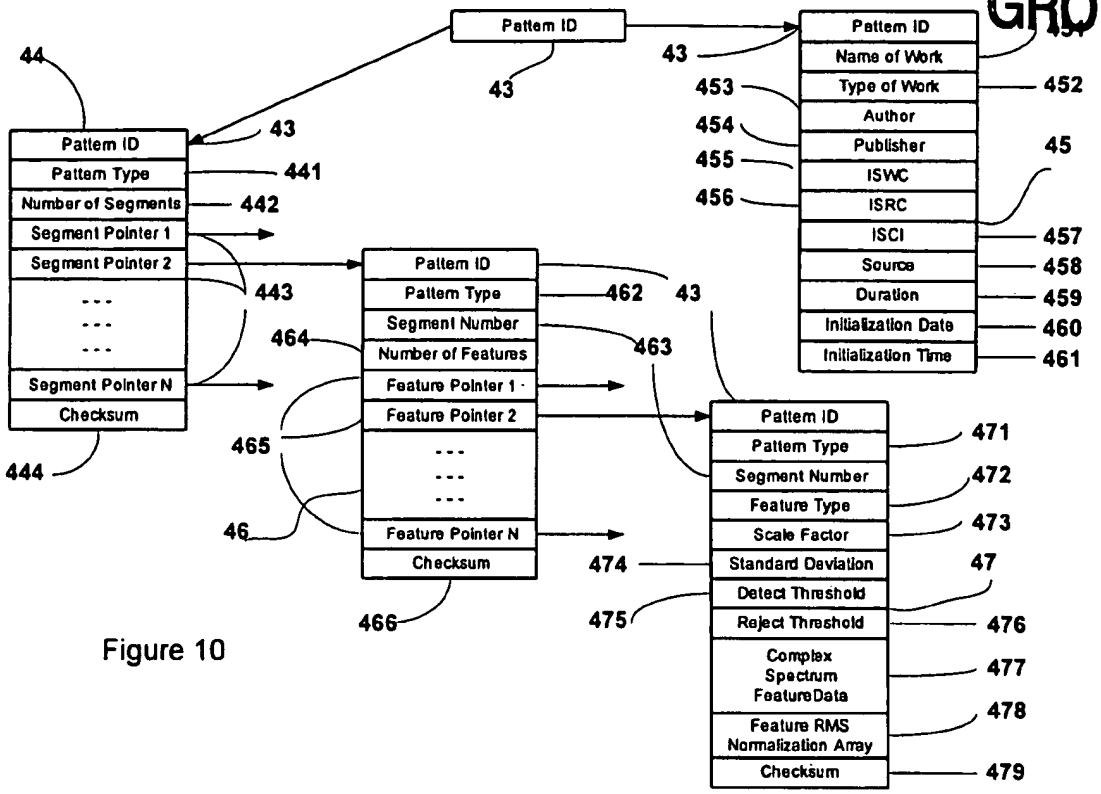

Figure 10

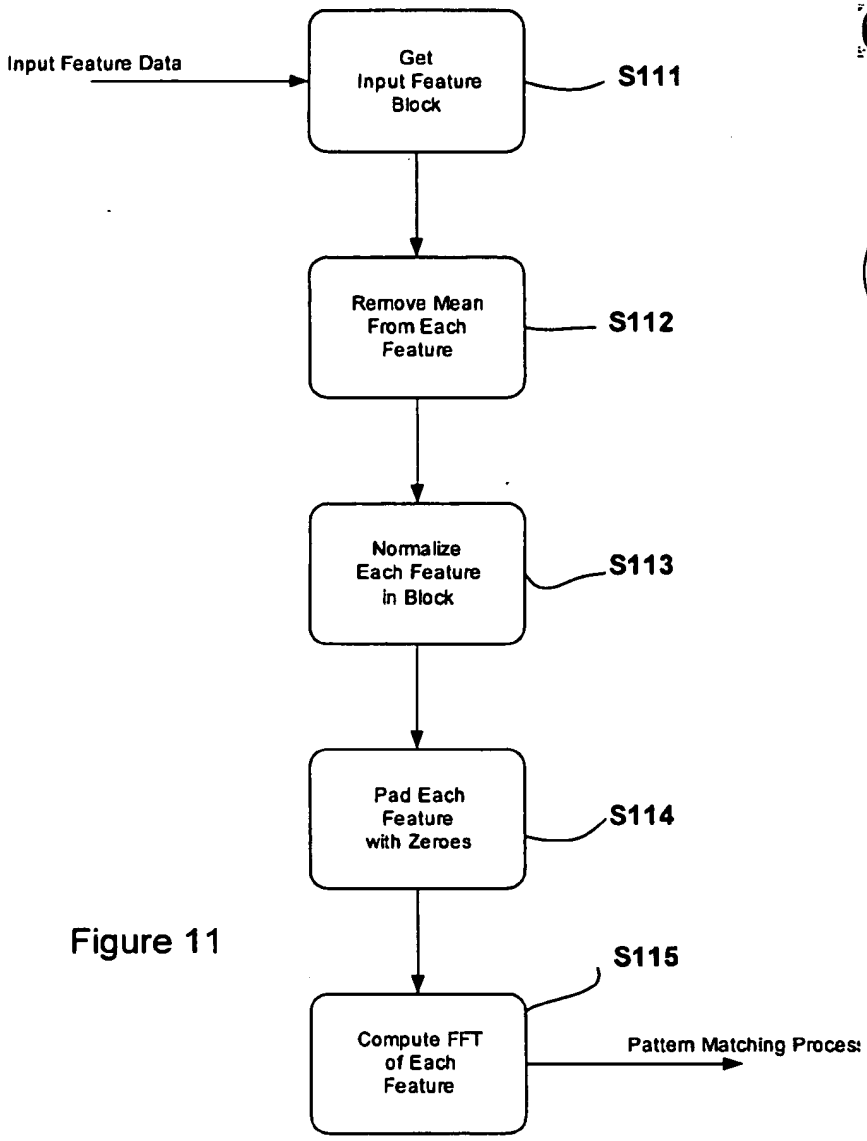

Figure 11

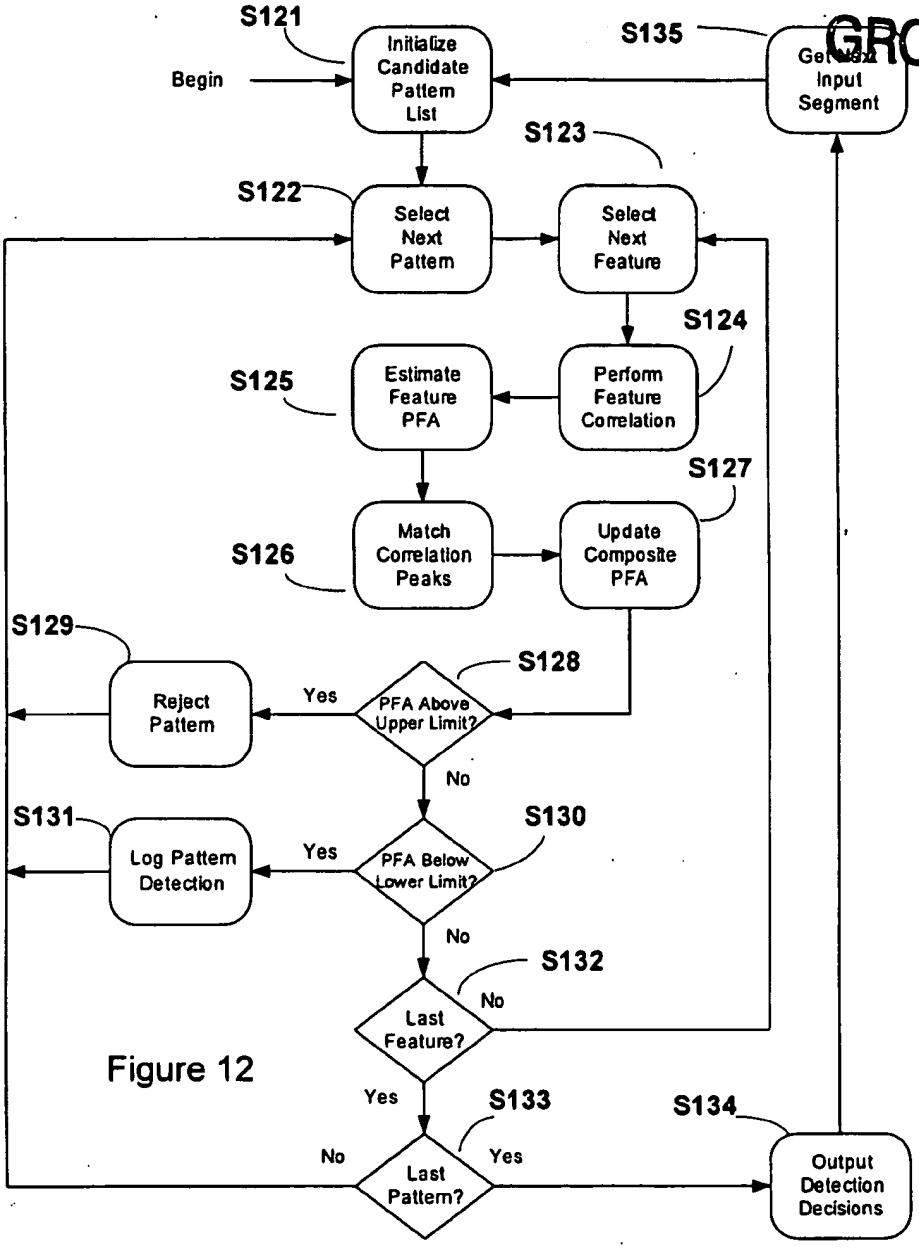

Figure 12

approved
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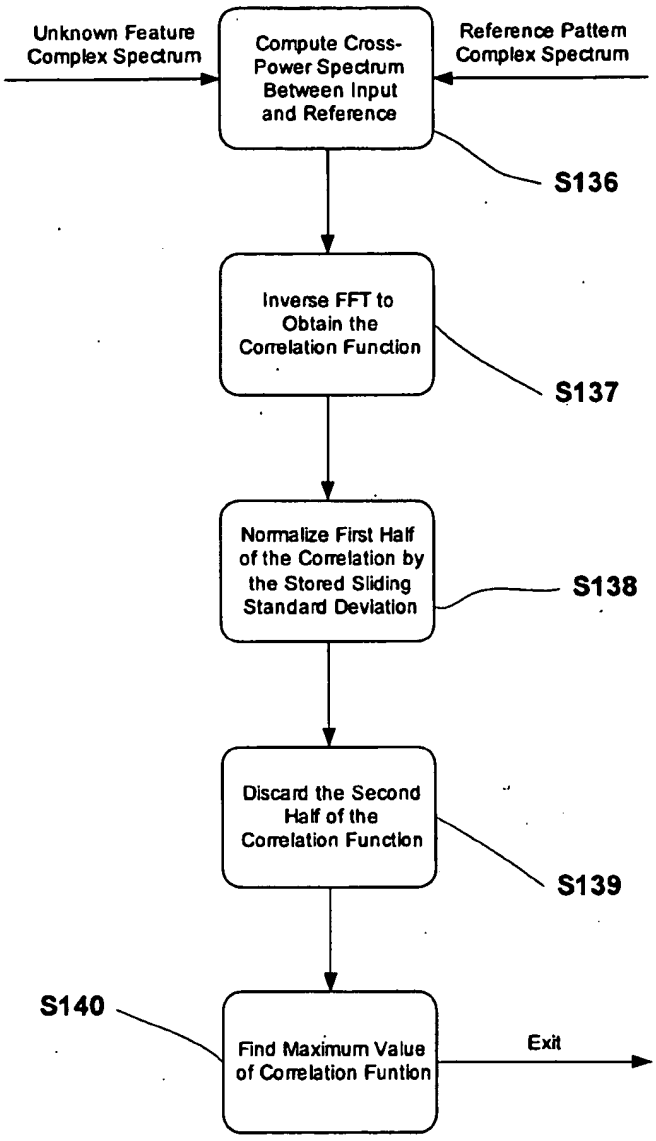

Figure 13

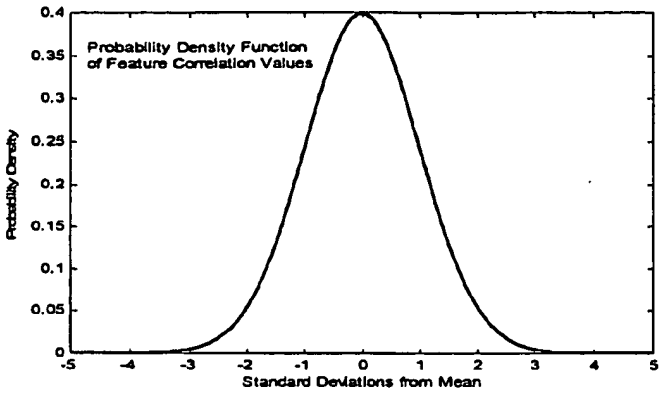

Fig 15A

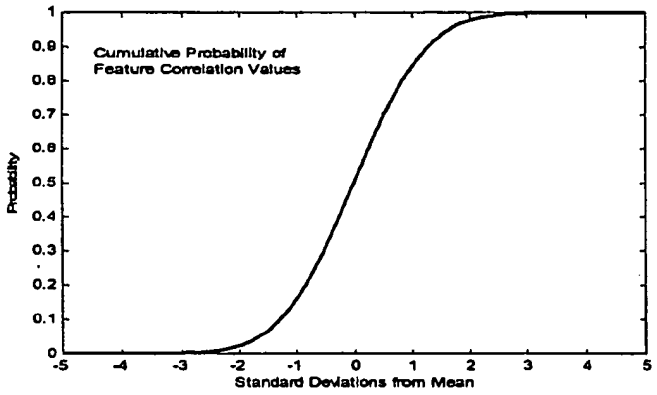

Fig 15B

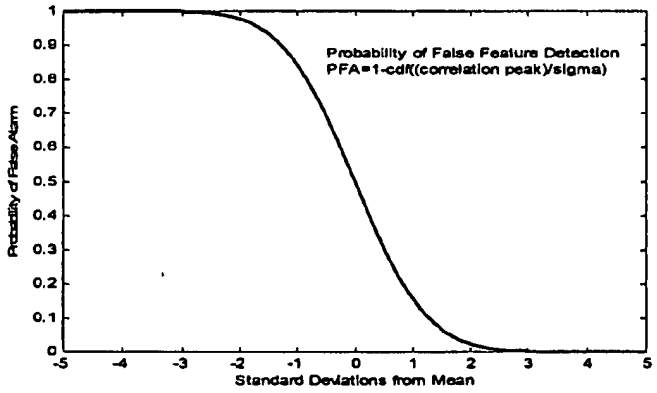

Fig 15C